

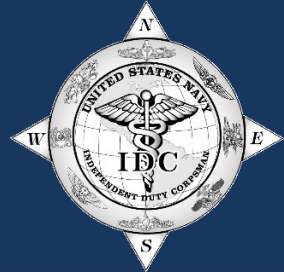
NHRC Capability Brief

AMAL Modernization

IDC Curriculum Review/Conference
13 - 15 May 2013



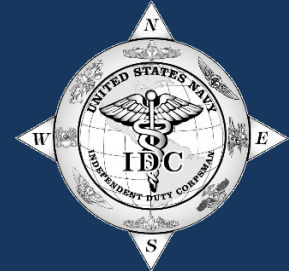
Discussion Points



- NHRC Modeling and Simulation past performance.
- Medical Modeling and Simulation research program goals.
- Key aspects of review results.
- NHRC's suite of planning tools.
- How are models constructed?
- Current projects.



NHRC Modeling and Simulation History



ONR sponsored Med Log study
NHRC began updating DMSB TTT files

ESP developed

ESP available on the web;
Quarterly updates provided

Developed RSVP for MCF submissions

Patient data expanded to include
HA/DR

LMI provides assessment
of medical M&S tools (JMLIS)

PCOF Tool accredited for Joint use

EMRE and CURCIT Tools Developed

Development History

1996

2000

2002

2004

2006

2008

2010

2012

1999

2001

2003

2005

2007

2009

2011

2013

USMC AMAL baselined

IDC/GMO AMAL evaluated
using ESP

Included logistics data and
died of wounds algorithm
in TML+

Air Force sponsor UTC review
using ESP methodology

Mapping PCs to ICD-9s

EESP for data warehouse
development

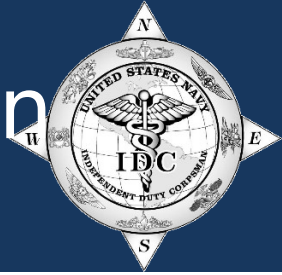
JMPT Accredited as Joint solution
for medical planning

EESP used to evaluate CNAF
Growler Wing Capability

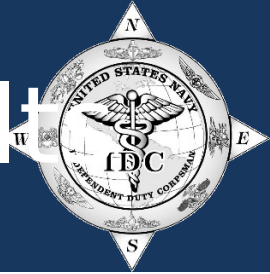
Expeditionary
Medicine
Knowledge
Warehouse



Medical Modeling and Simulation Research Program Goals



- Develop deliberate and crisis action planning tools for medical providers, planners, and logisticians
- Evaluate current and develop new expeditionary medical capabilities for the range of military operations
- Conduct deployment health studies and develop casualty estimation methodologies and tools using the Theater Medical Data Store (TMDS) and Hybrid Database

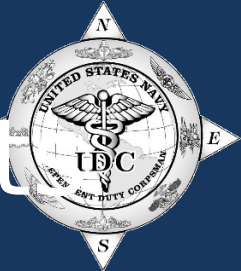


Key Aspects of Review Results

- ☐ Provides a systematic review methodology
 - Clinical Subject Matter Experts (SMEs) define/validate clinical requirements and prescribed clinical standards of care
 - All relevant stakeholders (i.e. clinicians, medical planners, biomedical repair technicians, logisticians, life cycle managers) are involved in the process
- ☐ Provides an audit trail for each recommended materiel component
 - Recommended revisions justified and linked to specific clinical task(s) and ICD-9(s)
 - Clinical and logistical impacts of supply and equipment deletions, additions or changes made visible
- ☐ Merges clinical and logistics data, all data available for use in other models (JMPT)



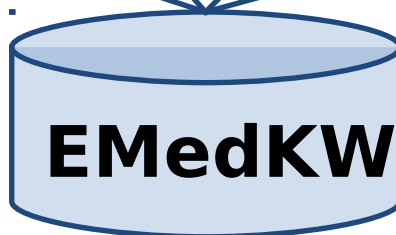
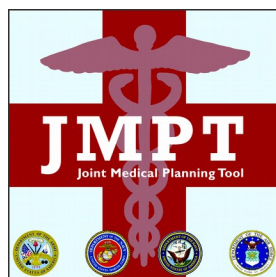
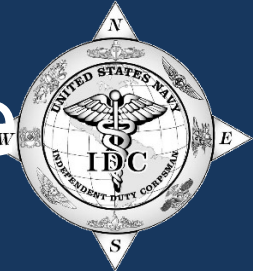
Key Aspects of Review Results



- ❑ NHRC published technical report provides a recommended logistics template based on the validated clinical capability requirements
- ❑ Methodology shown to be an effective tool used by USMC, USN and USAF in medical material development and management
- ❑ Relational database is flexible to enable scenario defined computations
 - EMedKW modifications made by NHRC or by using the maintenance tool in the program
 - Casualty rate projections used in other modeling tools
 - All EMedKW data used in JMPT to conduct medical risk assessment studies and analysis



NHRC's Medical Modeling Suite

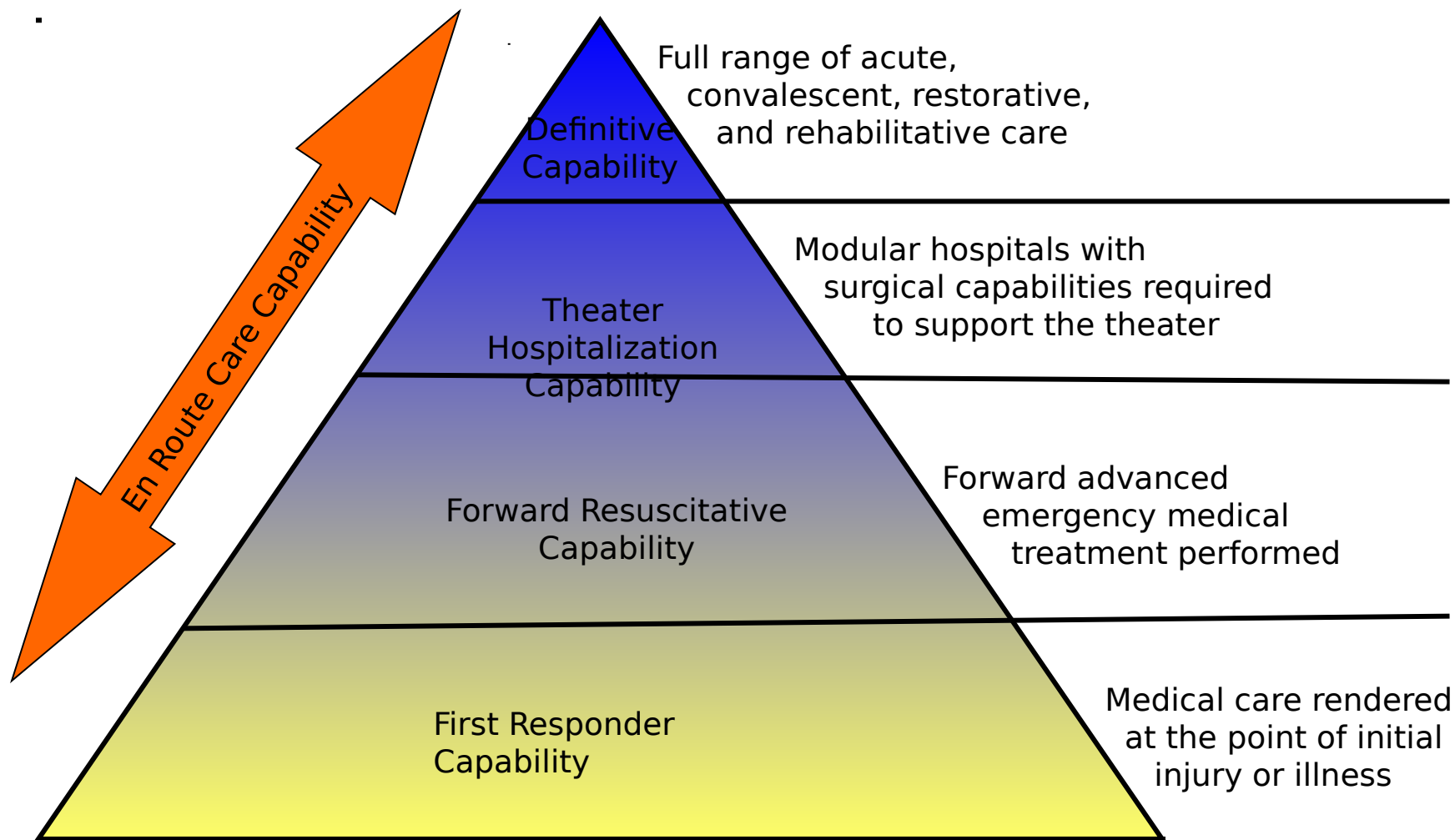
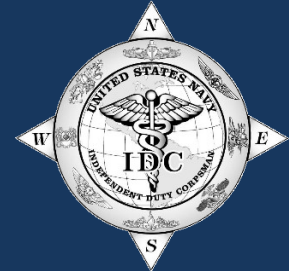


**Store underlying
data**

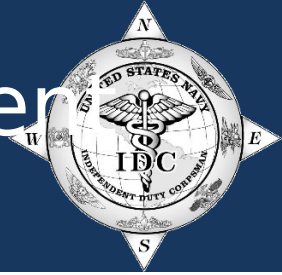
Readiness Through Research and Development



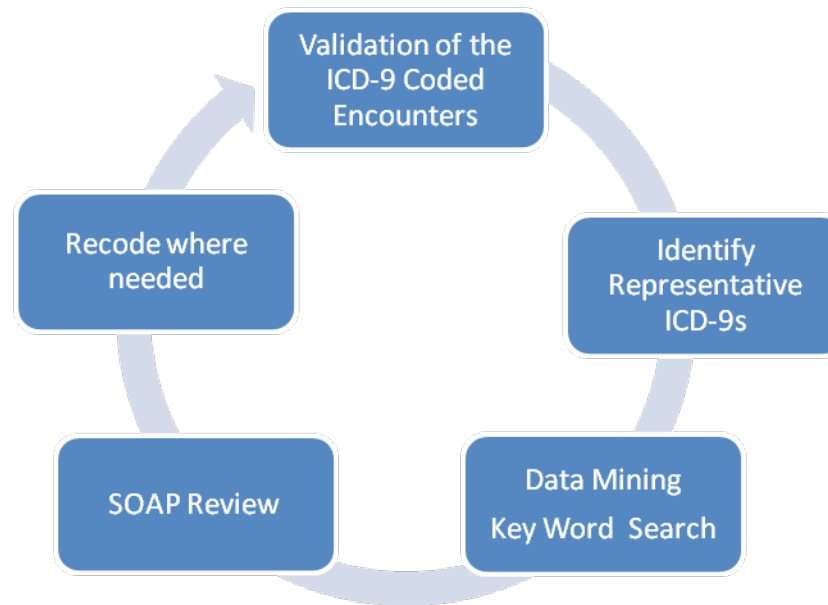
Taxonomy Continuum of Health Care Capabilities



Readiness Through Research and Development



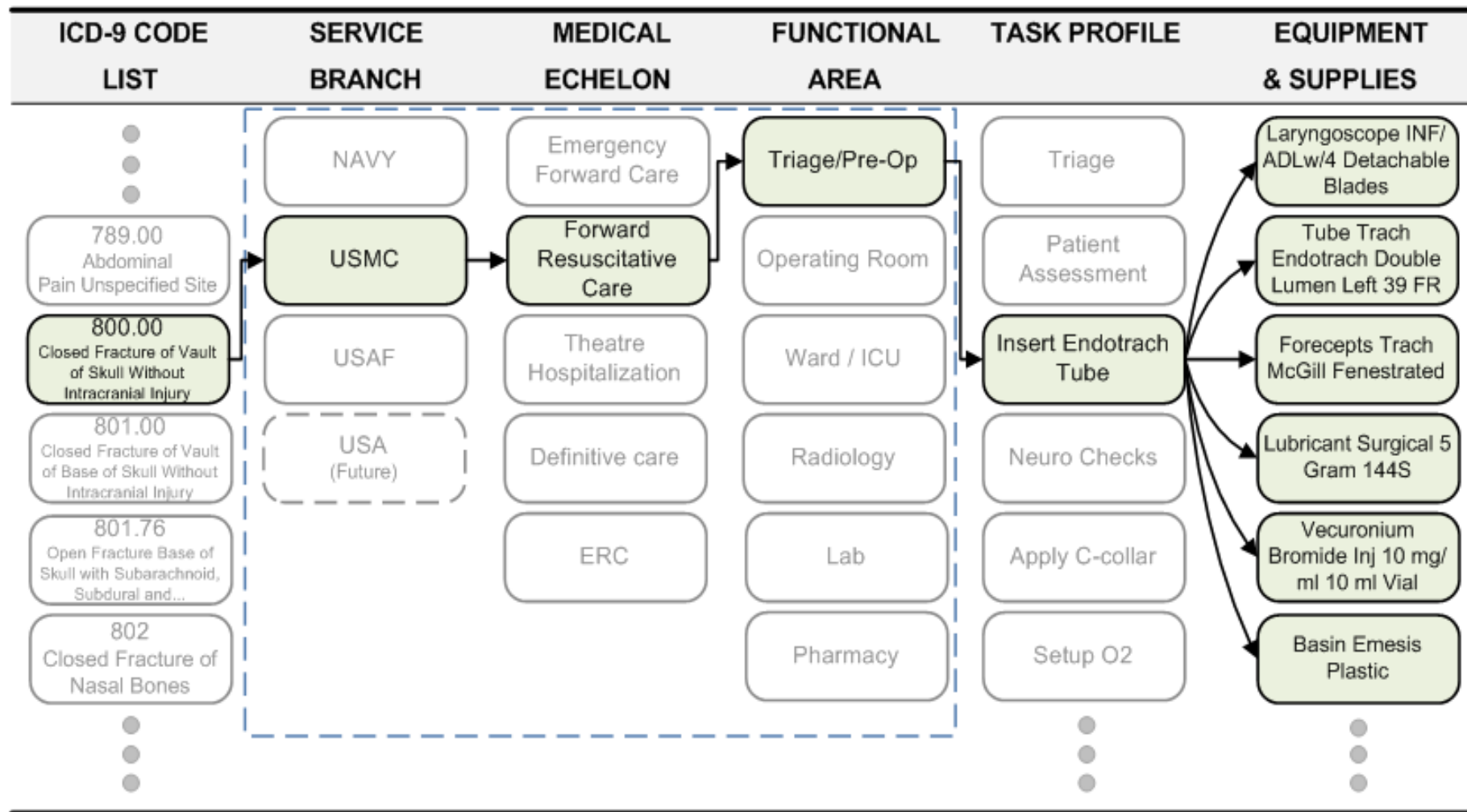
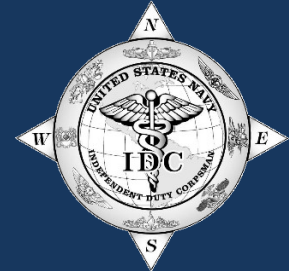
Patient Encounter Data Development and Refinement

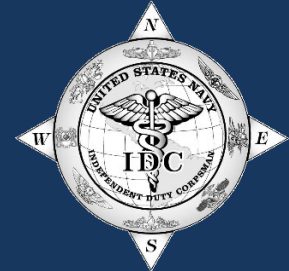


Readiness Through Research and Development

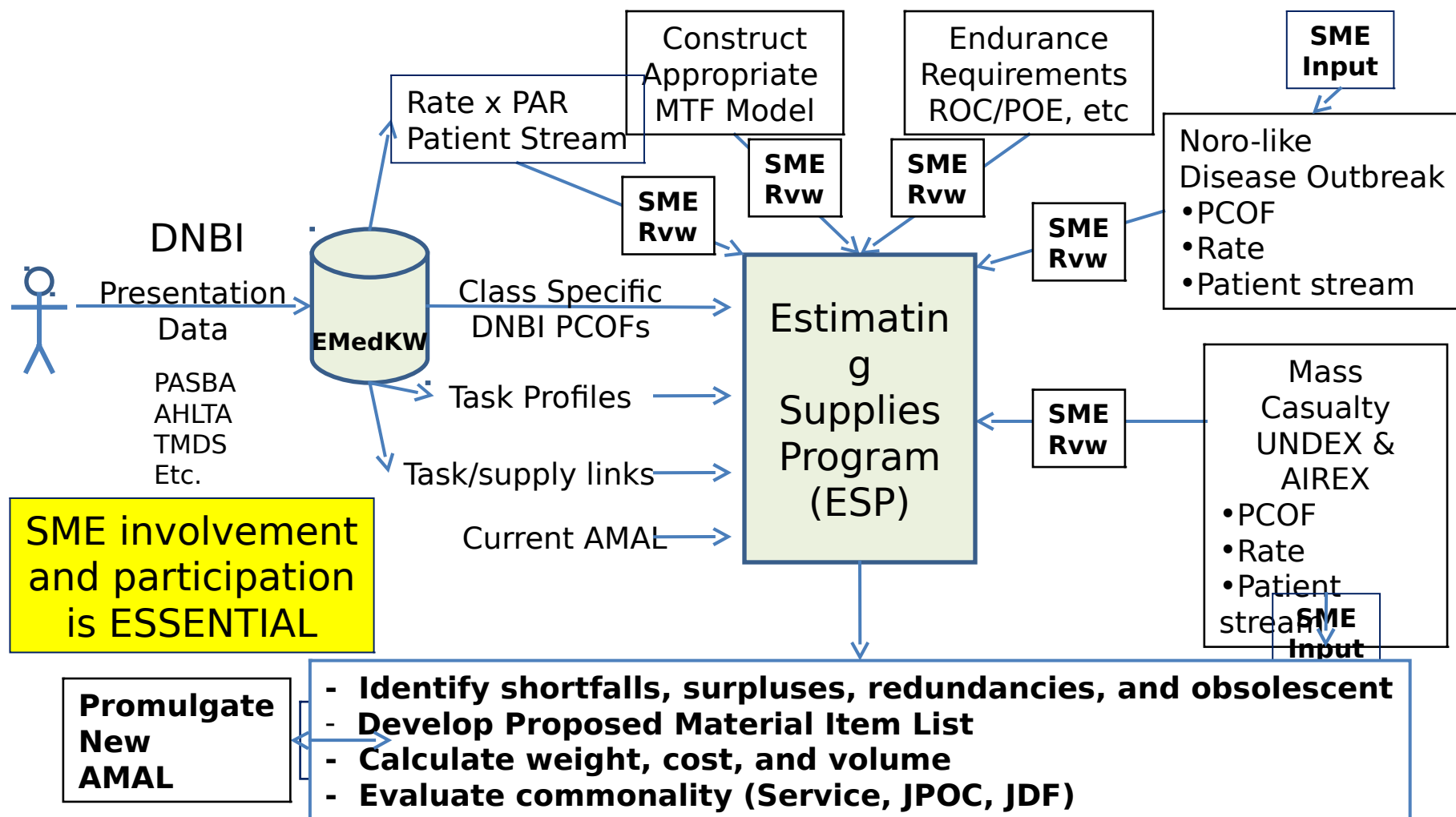


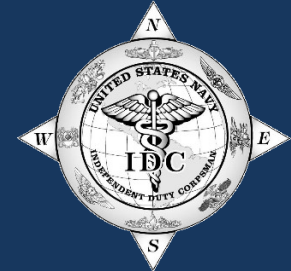
ICD9 Clinical Basis for Supplies



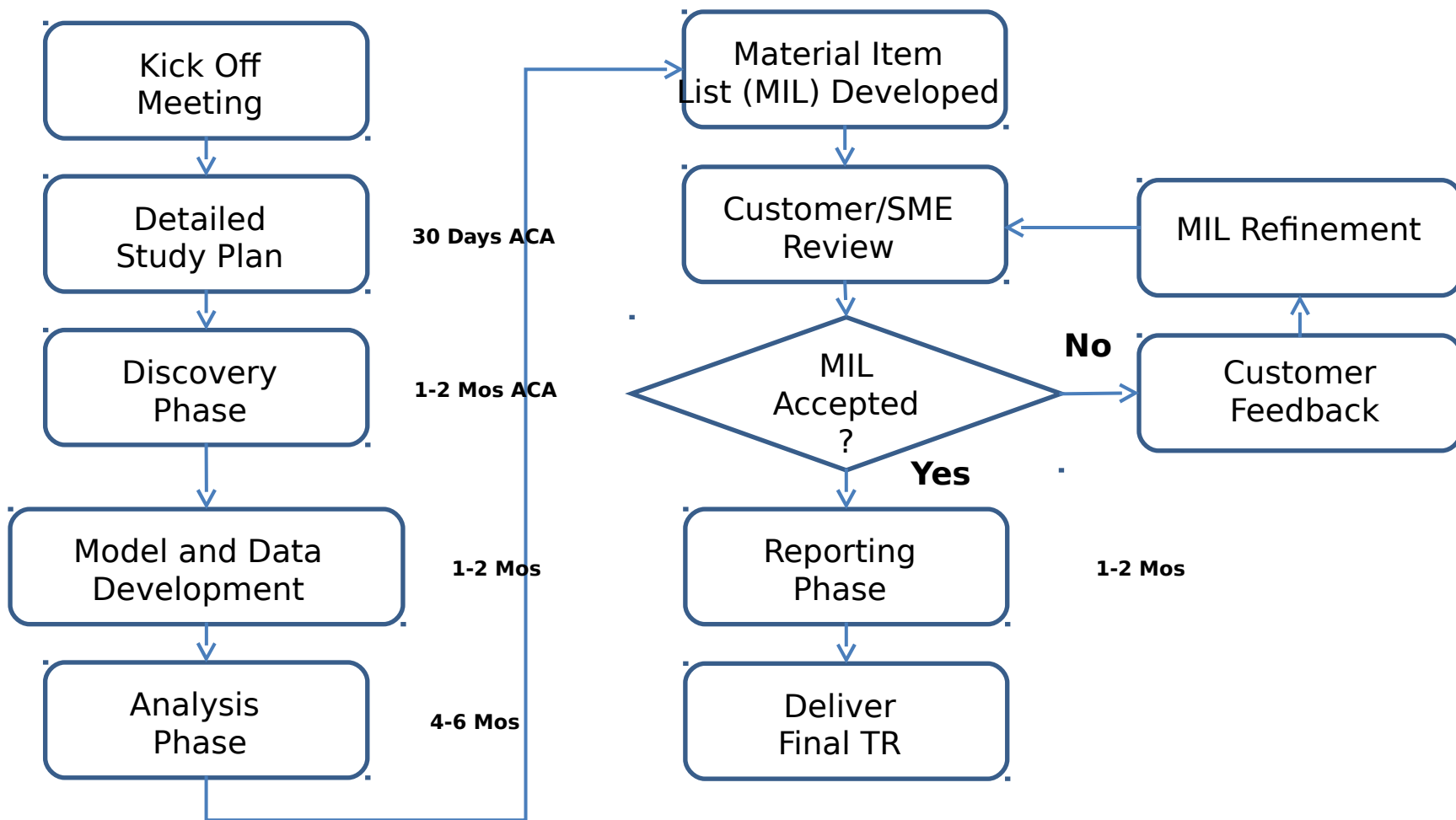


SME Contribution



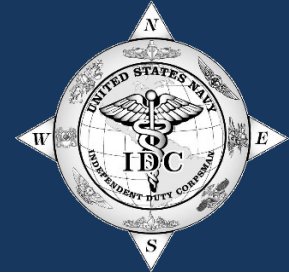


Process Flow





Discovery Phase

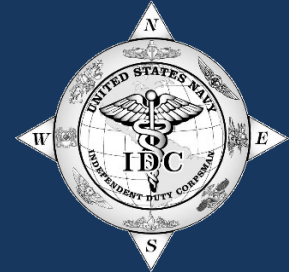


This phase includes:

- Review of published journal literature
- Review of official doctrine and policy
- Review of operational requirements documents
- Review of AAR and medical lessons learned
- Discussion with experienced subject matter experts



Data Collection

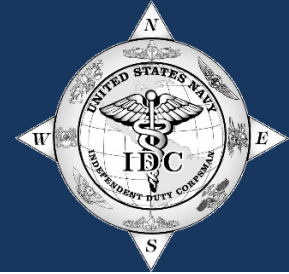


This phase includes:

- Patient presentation data from JTTR, TMDS, AHLTA, and GEMS
- UICs can be used to specify unit types (SME input)
- De-identified patient data analyzed by NHRC statisticians
- Patient data reviewed by appropriate SMEs



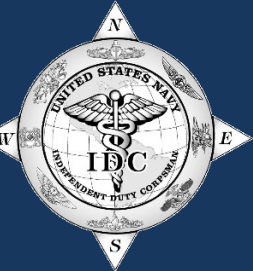
SME Review: AMAL Considerations



- Is AMAL capability based on PAR or patient load (i.e., 50 casualties)?
- What is the required endurance without resupply (15 days, 30 days, etc.)?
- What is the level of care and skills of the MTF and its personnel?
- Are there weight and cube restrictions?



Establish Patient Stream

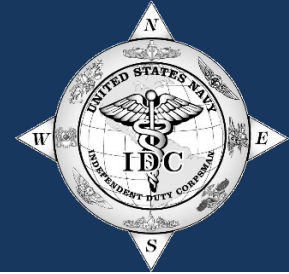


This includes:

- Patient condition occurrence frequencies (PCOFs) are developed from collected patient data
 - The population at risk for a CVN is 5200
 - Historically speaking 11% of a PAR reports for a 30 day period, the expected casualty stream is 572
 - The patient stream is a function of 572 draws on the PCOF



Modeling phase

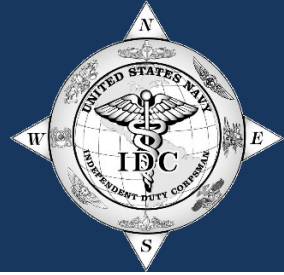


This includes:

- Development of clinical tasks needed to treat occurring ICD-9s
- Review and validation of clinical task list by SMEs
- Completion of model construction



Analysis Phase

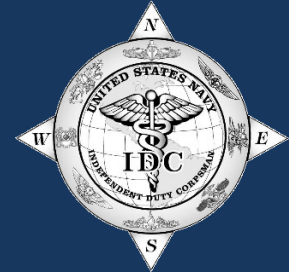


This phase includes:

- Multiple model runs will determine any supply excesses or shortages in AMAL.
- Statistical analysis used to determine average usage of each supply item.
- NHRC consults with meets with the customer to determine risk analysis confidence level (normally 85th percentile).
- Decision: are any revisions needed?
 - YES – return to SME review.
 - NO – new line list is finalized.

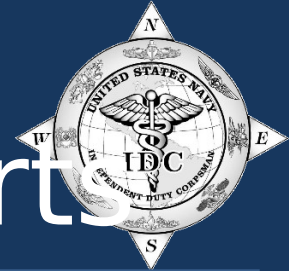


Reporting Phase



This phase includes:

- Authoring technical document documenting the process used to create the AMAL, and a detailed line list identifying supply item additions, deletions, increases or decreases, and the reason for each change.
- Draft report submitted to sponsor while report is vetted by NHRC and BUMED editing process.
- Final report delivered to sponsor.



AMAL Modernization Efforts

- FY12
 - Air Expeditionary AMAL (Prowler/Growler dets, etc) - CNAF
 - Afloat DNBI Phase One Study (SSN, CG, CVN) - NMLC
- FY13
 - CVN AMAL Modernization review - CNAF
 - AFLOAT AMAL Modernization - NMLC
 - CRUDES (CG, DDG, FFG)
 - Small Combatant (MCM, PC, LCS)
 - Submarine (SSN, SSBN, SSGN)
 - Amphibious role 1 (LPD, LHD)
- FY14
 - T-AH AMAL Standardization - FFC?
 - Two year effort due to scope
 - LHA, LPD17 role 2 Modernization - NMLC?
 - Adaptive Force Packages
 - ERSS
 - AEGIS Ashore
- FY14 and beyond
 - AMAL Maintenance support

Status

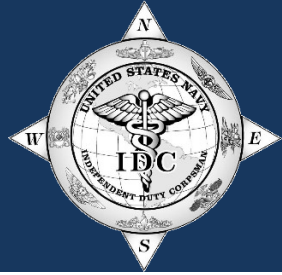
Complete

Complete

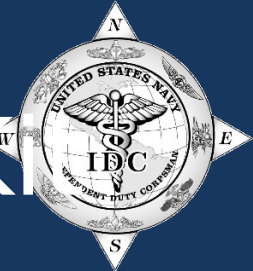
In Progress

**Start Imminent
1 year PoP**

Proposed



Backup Slides



Joint Medical Planning Tool Kit

A suite of tools to support medical planners, analysts, and logisticians



The PCOF tool projects probability of injury and illness across the ROMO.

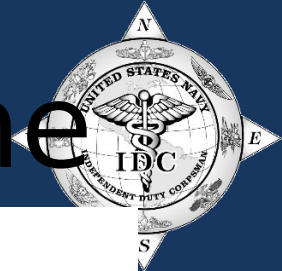
Patient
Condition
Occurrence
Frequency



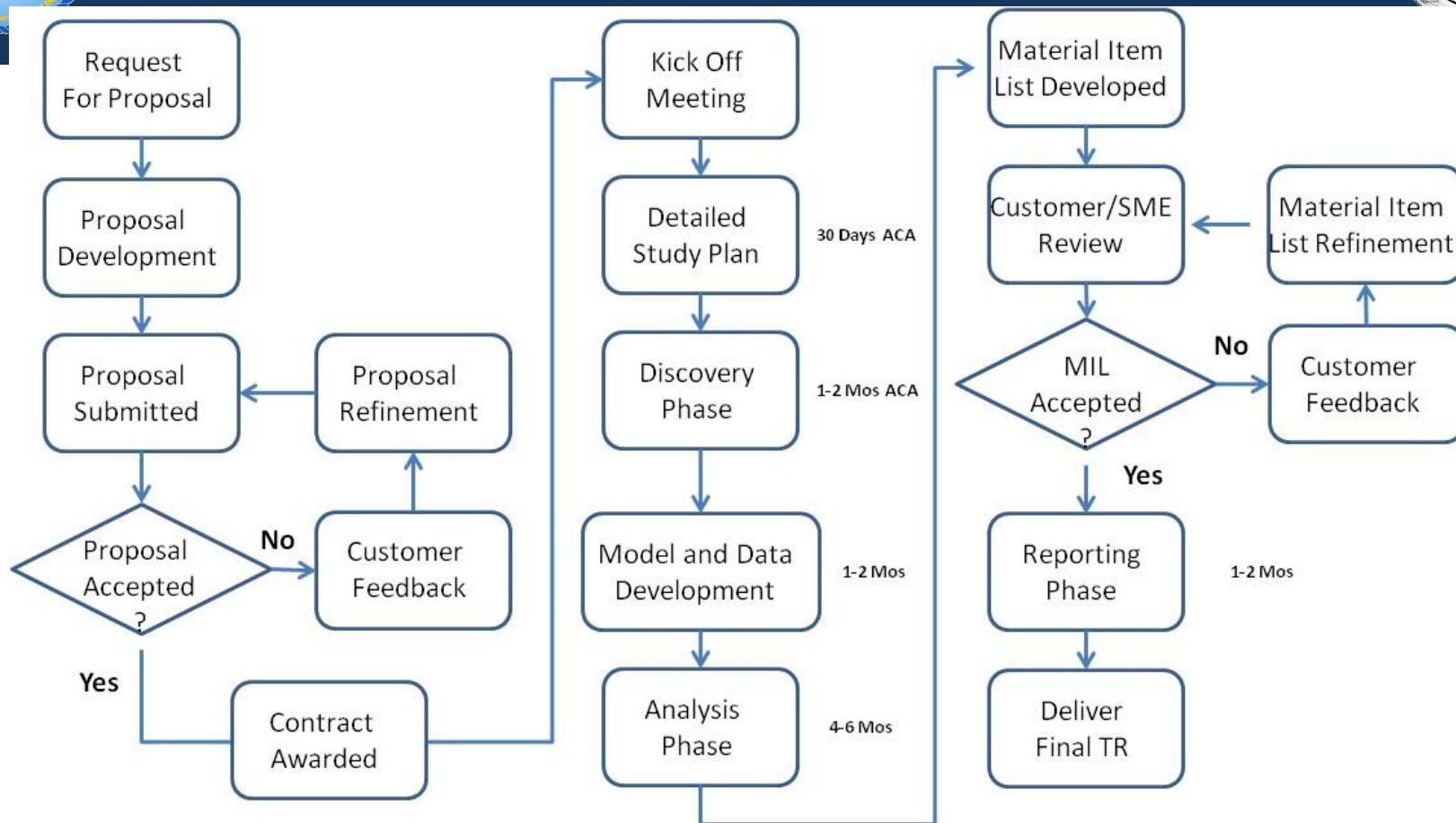
CIRCIT provides casualty estimates for combat, HA, and DR missions.

EMRE estimates blood, OR, ICU, and evacuation requirements as a function of patient load.





Process Flow and Timeline



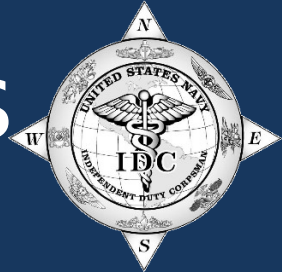
Discovery Phase: Determine patient types (wounded in action, non-battle injury, and disease), LOC, FAs, latest AMAL/AS, ROC/POE, new equipment/supplies/TTPs, research lessons learned and each line item; SME review by medical professionals; expected types of injuries and how many of each is likely to occur; SME review.

Model and Data Development Phase: Based on information and data developed during Discovery, appropriate MTF and functional area models built in EMedKW. During this phase patient streams based on PAR, and rate information are derived from PCOF and CRESTT to establish patient stream; reviewed by/with SMEs.

Analysis Phase: Using a deterministic modeling program (ESP) supply estimates based on patient streams, ROC and POE are derived. The Material Item List (MIL) is developed at the NSN level and metrics including additions, deletions, increases, and decreases are provided. Cost, weight and volume changes are computed.



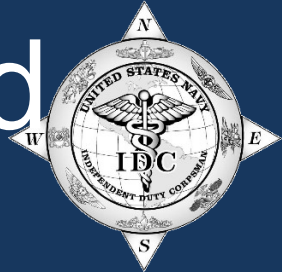
Why Allowance Standards Need Maintenance



- Changes in standards of care
- The forward-deployed environment is dynamic
 - Updated tactics, techniques, and procedures
 - New weaponry, threats, environments
 - Modified personal protective equipment
 - Adapted treatment protocols
 - Introduction of improved medical supplies and equipment
- The imperative to facilitate/advance standardization
 - Between services and across the ROMO
- Continuous modernization of supplies & equipment
 - Example: Combat Application Tourniquet (CAT), a one handed, more effective item named one of the Army's 10 Greatest Inventions for 2005



Benefits of Modeling and Simulation



- Standardized, science-based, repeatable methodology
- Compatible with MCRW
 - Provides new/updated baseline PCOFs to MCRW
 - Capable of filling current shipboard PCOF gap
- Inventories based on clinical necessity
 - Supports routine AMAL maintenance cycle
- Reduces cost
- Enhances standardization (JPOC, JDF, Service)

Expeditionary Medical Knowledge Warehouse

Inputs

